CLAIMS

WHAT IS CLAIMED IS:

1. A method for reducing Nonuniform Rotational Distortion (NURD) in an image, said image comprising a plurality of image vectors, each image vector having texture and each image vector being mapped to an angle in the image, the method comprising:

computing an average frequency of the texture for each image vector;

estimating an angle for each image vector based on the average frequency for the respective image vector; and

remapping each image vector to the estimated angle for the respective image vector.

2. The method of claim 1, wherein each image vector comprises a plurality of pixels, each pixel representing the amplitude of an echo pulse reflected from a certain image depth.

3. The method of claim 2, wherein the step of computing the average frequency for each image vector further comprises:

computing a mean frequency of the texture for each pixel in each image vector; and

computing an average of the mean frequency for the pixels in each image vector.

4. The method of claim 3, wherein the step of computing the mean frequency for each pixel further comprises:

performing a Fourier transform around each pixel; and

computing a mean of the Fourier transform for each pixel.

5. The method of claim 1, wherein the step of estimating the angle for each image vector further comprises:

computing an integral of the average frequency for all of the image vectors

normalizing the integral to a predetermined value; and

estimating the angle for the each image vector based on the value of the normalized integral at the respective image vector.

6. The method of claim 5, wherein the predetermined value is 2π radians.

7. The method of claim 3, wherein the step of estimating the angle for each image vector further comprises:

computing an integral of the average frequency for all of the image vectors;

normalizing the integral to a predetermined value; and

estimating the angle for the each image vector based on the value of the normalized integral at the respective image vector.

8. The method of claim 7, wherein the predetermined value is 2π radians.

9. A computer program product that includes a medium useable by a processor, the medium comprising a sequence of instructions which, when executed by the processor, causes the processor to execute a method for reducing Nonuniform Rotational Distortion (NURD) in an image, the computer program product comprising:

an instruction for receiving an input image, the input image comprising a

plurality of image vectors, each image vector having texture and each image vector being mapped to an angle in the image;

an instruction for computing an average frequency of the texture for each image vector in the input image;

an instruction for estimating an angle for each image vector based on the average frequency for the respective image vector; and

an instruction for producing an output image by remapping each image vector to the estimated angle for the respective image vector.

10. The computer program product of claim 9, wherein each image vector comprises a plurality of pixels, each pixel representing the amplitude of an echo pulse reflected from a certain image depth.

11. The computer program product of claim 10, wherein the instruction for computing the average frequency for each image vector further comprises:

an instruction for computing a mean frequency of the texture for each pixel in each image vector; and

an instruction for computing an average of the mean frequency for the pixels in each image vector.

12. The computer program product of claim 11, wherein the instruction computing the mean frequency for each pixel further comprises:

an instruction for performing a Fourier transform on the image around each pixel; and

an instruction for computing a mean of the Fourier transform for each pixel.

13. The computer program product of claim 9, wherein the instruction for estimating the angle for each image vector further comprises:

an instruction for computing an integral of the average frequency for all of the image vectors;

an instruction for normalizing the integral to a predetermined value; and

an instruction for estimating the angle for the each image vector based on the value of the normalized integral at the respective image vector.

14. The computer program product of claim 13, wherein the predetermined value is 2π radians.

15. A medical imaging system comprising:

(a) a processor;

(b) an interface to receive data for the processor to use to create a medical image; and

(c) a medium useable by the processor, the medium comprising a sequence of instructions which, when executed by the processor, causes the processor to create a medical image with reduced Nonuniform Rotational Distortion (NURD), the medium including

(i) an instruction for receiving an input image, the input image comprising a plurality of image vectors, each image vector having texture and each image vector being mapped to an angle in the image;

(ii) an instruction for computing an average frequency of the texture for each image vector in the input image;

(iii) an instruction for estimating an angle for each image vector

based on the average frequency for the respective image vector; and

(iv) an instruction for producing an output image by remapping each image vector to the estimated angle for the respective image vector.

16. The medical imaging system of claim 15 further comprising a display to display the output image.

17. The medical imaging system of claim 15 further comprising a printer to print the output image.

18. The medical imaging system of claim 15 further comprising:

a catheter; and

an ultrasound transducer mounted on the catheter, the ultrasound transducer to be rotated by a motor, the ultrasound transducer to emit ultrasound waves and to receive reflected ultrasound waves, the ultrasound transducer to send reflected ultrasound waves to the interface.

19. The medical imaging system of claim 15, wherein each image vector comprises a plurality of pixels, each pixel representing the amplitude of an echo pulse reflected from a certain image depth.

20. The medical imaging system of claim 19, wherein the instruction for computing the average frequency for each image vector further comprises:

an instruction for computing a mean frequency of the texture for each pixel in each image vector; and

an instruction for computing an average of the mean frequency for the pixels in each image vector.

21. The medical imaging system of claim 20, wherein the instruction for computing the mean frequency for each pixel further comprises:

an instruction for performing a Fourier transform on the image around each pixel; and

an instruction for computing a mean of the Fourier transform for each pixel.

22. The medical imaging system of claim 15, wherein the instruction for estimating the angle for each image vector further comprises:

an instruction for computing an integral of the average frequency for all of the image vectors;

an instruction for normalizing the integral to a predetermined value; and

an instruction for estimating the angle for the each image vector based on the value of the normalized integral at the respective image vector.

23. The medical imaging system of claim 22, wherein the predetermined value is 2π radians.